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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,464	08/09/2001	Hiroshi Sotozaki	2001-1104A	2928

513 7590 12/22/2003

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WASHINGTON, DC 20006-1021

EXAMINER

BALSIS, SHAY L

ART UNIT	PAPER NUMBER
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1744

DATE MAILED: 12/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/924,464

Applicant(s)

SOTOZAKI ET AL.

Examiner

Shay L Balsis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 5, 9, 12 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Page 14, line 22 reads "roller transfer base 84" however reference number 84 was already disclosed as "check bolts" in line 19.

Page 14, line 23 reads "check bolts 72" however reference number 72 was already disclosed as "roller transfer base" in line 18.

Appropriate correction is required.

Claim Objections

2. Claims 5, 9, 12 and 14 recite the limitation "the free end of a swingable swing arm" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-5, 7-9, 11-12, 14 and 17-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Ziemins et al. (USPN 6622334).

Ziemins teaches a substrate cleaning device comprising a plurality of substrate rotating rollers (24) for rotating the wafer and cleaning rollers (28) for cleaning the edge of the wafer.

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Both the rotating roller and cleaning rollers are located on a common base or swinging swing arm. The cleaning roller comprises a groove for receiving the wafer and is located on the free end of the swing arm. There is a power transmission mechanism for transmitting a rotating force from the rotating rollers to the cleaning roller. The power transmission mechanism has its revolution transfer ratio set such that there is difference in velocity between the cleaning member and the wafer. There is an ultrasonic nozzle (not shown, col. 4, lines 64-68) for injecting a cleaning liquid against a surface of the wafer. There is a force adjusting mechanism (22) for biasing the cleaning member against the edge of the wafer.

5. Claims 1-4, 6-8, 10, 12-13, 15-16, 17-19 and 21 are rejected under 35 U.S.C. 102(a/e) as being anticipated by Yashiki et al. (USPN 6041465).

Yashiki teaches a substrate cleaning device comprising a plurality of substrate rotating rollers (12) for rotating the wafer and cleaning rollers (12) for cleaning the edge of the wafer. Since there are three rollers, the examiner is considering one of the rollers to be a cleaning roller since there are circumferential grooves (14) that are formed by a polyurethane foam (col. 10, lines 35-36). It is known in the art to use polyurethane foam as a wafer edge cleaner. Both the rotating roller and cleaning rollers are located on a common base (13). There is a power transmission mechanism for transmitting a rotating force from the rotating rollers to the cleaning roller. The power transmission mechanism has its revolution transfer ratio set such that there is difference in velocity between the cleaning member and the wafer. There is a nozzle (5-1, 5-2) for injecting a cleaning liquid against a surface of the wafer. There is a force adjusting mechanism (16) for biasing the cleaning member against the edge of the wafer. There are

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multiple grooves on the rollers that act as a contact location adjusting mechanism for adjusting the vertical placement of the wafer (figure 11 and figure 15).

6. Claims 1-4, 7-8, 11, 17-19 and 21 are rejected under 35 U.S.C. 102(a/e) as being anticipated by Frey (USPN 6082377).

Frey teaches a substrate cleaning device comprising a plurality of substrate rotating rollers (172) for rotating the wafer and cleaning rollers (203) for cleaning the edge of the wafer. Both the rotating roller and cleaning rollers are located on a common base (168, figure 6). The cleaning roller comprises a groove for receiving the wafer and is located on the free end of the swing arm. There is a power transmission mechanism (180) for transmitting a rotating force from the rotating rollers to the cleaning roller. The power transmission mechanism has its revolution transfer ratio set such that there is difference in velocity between the cleaning member and the wafer. There is an ultrasonic nozzle (322) for injecting a cleaning liquid against a surface of the wafer. There is a force adjusting mechanism (176) for biasing the cleaning member against the edge of the wafer.

7. Claims 17-19 and 21 are rejected under 35 U.S.C. 102(a/e) as being anticipated by Sawada et al. (USPN 6012192).

Sawada teaches a substrate cleaning device comprising a plurality of substrate rotating rollers (16) for rotating the wafer and cleaning rollers (50) for cleaning and end face of the wafer. Both the rotating roller and cleaning rollers are located on a common base (13, 33). The cleaning roller comprises a groove for receiving the wafer. There is a power transmission mechanism (18) for transmitting a rotating force from the rotating rollers to the cleaning roller.

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Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yashiki et al. (USPN 6041465) in view of Shinbara et al. (USPN 5485644), Frey (USPN 6082377) in view of Shinbara et al. (USPN 5485644) and Sawada et al. (USPN 6012192) in view of Shinbara et al. (USPN 5485644).

Yashiki, Frey and Sawada all teach a wafer cleaning apparatus comprising a nozzle for dispensing cleaning liquid to a surface of the wafer, however the references fail to an ultrasonic nozzle. Shinbara teaches a wafer cleaning apparatus comprising an ultrasonic nozzle (139). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply ultrasonic vibrations to the cleaning liquid to optimize the cleaning efficiency. Ultrasonic vibrations create large acoustic forces, which in turn break off particles and contaminants from surfaces; ultimately providing a clean surface/wafer.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shay L Balsis whose telephone number is presently 703-305-7275 after December 16, 2003 571-272-1268. The examiner can normally be reached on 7:30-5:00 M-Th, alternating F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Warden can be reached on 703-308-2920 after December 16, 2003 571-272-1281. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-5665.

Slb
12/12/03

Robert J. Warden, Sr.
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